

**WHAT IS CLAIMED IS:**

1. A subscriber interface device for transmitting a communication signal and a broadcasting signal to each subscriber in a communication-broadcasting convergence FTTH (Fiber To The Home) system having an OLT (Optical Line Terminal) for transmitting digital broadcasting information received over an external broadcasting network and received external data communication information, an ONU (Optical Network Unit) for separating optical signals received from the OLT into broadcasting signals and communication signals, converting the broadcasting and communication signals to electrical signals, processing upstream information received from subscribers, and optically transmitting the broadcasting and communication signals selectively according to the individual subscribers, and an ONT (Optical Network Terminal) for converting an optical signal received from the ONU to an electrical signal, splitting the electrical signal for respective services, and transmitting the split electrical signals to a subscriber terminal, wherein the subscriber interface device comprises:

a subscriber interface transmitter arranged in the ONU, for modulating a first predetermined number of broadcasting signals selected by the subscriber among broadcasting signals received from the OLT, combining a baseband communication signal received from the OLT with the modulated broadcasting signals, and optically transmitting the combined communication-broadcasting signal; and

a subscriber interface receiver arranged in the ONT, for splitting the combined communication-broadcasting signal received from the subscriber interface transmitter, filtering the split signals to respective frequency bands, modulating the filtered

broadcasting signals, transmitting the modulated broadcasting signals to a monitor of the subscriber, and transmitting the filtered communication signal as a baseband signal to a communication terminal of the subscriber.

5           2.       The subscriber interface device of claim 1, wherein the subscriber interface transmitter comprises:

          the first predetermined number of modulators for modulating the broadcasting signals respectively;

          a second predetermined number of frequency generators for generating carrier  
10 frequencies to be assigned to the broadcasting signals;

          a third predetermined number of BPFs (Band Pass Filters) for limiting the bands of the modulated broadcasting signals to suppress noise;

          an LPF (Low Pass Filter) for limiting the band of the communication signal;

          a combiner for combining the baseband communication signal with the  
15 modulated broadcasting signals;

          an optical transmitter/converter for converting the electrical combined communication-broadcasting signal to an optical signal prior to transmission to the ONT; and

          an optical receiver/converter for receiving an Ethernet signal being upstream  
20 information received from the ONT and converting the optical Ethernet signal to an electrical signal.

3. The subscriber interface device of claim 1, wherein the subscriber interface receiver comprises:

an optical receiver/converter for converting an optical signal received from the ONU;

5 a splitter for splitting the received optical into the first predetermined number of broadcasting signals and the communication signal;

a fourth predetermined number of BPFs for limiting the bands of the split broadcasting signals to extract the individual broadcasting signals;

10 a fifth predetermined number of demodulators for demodulating the broadcasting signals;

a sixth predetermined number of frequency generators each having a PLL (Phase Locked Loop) for generating a demodulation frequency for each of the broadcasting signals;

15 a seventh predetermined number of broadcasting signal outputs for outputting the first predetermined number of demodulated broadcasting signals;

an LPF for filtering the split communication signal in the baseband to extract the communication signal; and

an optical transmitter for transmitting an upstream Ethernet signal to the ONU.

20 4. The subscriber interface device of claim 3, wherein the broadcasting signal outputs to an LPF for extracting the demodulated broadcasting signals and a CDR (Clock & Data Recovery circuit) for recovering original broadcasting signals.

5. The subscriber interface device according to claim 1, wherein the first predetermined number is one of 2 to 7.

6. The subscriber interface device according to claim 2, wherein the first  
5 predetermined number is one of 2 to 7.

7. The subscriber interface device according to claim 3, wherein the first predetermined number is one of 2 to 7.

10 8. The subscriber interface device according to claim 4, wherein the first predetermined number is one of 2 to 7.

9. The subscriber interface device of claim 2, wherein the modulators and demodulators modulate and demodulate by Quadrature Phase Shift Keying (QPSK).

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10. The subscriber interface device of claim 3, wherein the modulators and demodulators modulate and demodulate by Quadrature Phase Shift Keying (QPSK).

11. The subscriber interface device of claim 4, wherein the modulators  
20 and demodulators modulate and demodulate by Quadrature Phase Shift Keying (QPSK).

12. The subscriber interface device of claim 2, wherein the modulators and demodulators modulate and demodulate by Quadrature Amplitude Modulation (QAM).

13. The subscriber interface device of claim 3, wherein the modulators and demodulators modulate and demodulate by Quadrature Amplitude Modulation (QAM).

5 14. The subscriber interface device of claim 4, wherein the modulators and demodulators modulate and demodulate by Quadrature Amplitude Modulation (QAM).

15. A method for transmitting a communication signal and a broadcasting  
10 signal to each subscriber in a communication-broadcasting convergence FTTH (Fiber To The Home) system having an OLT (Optical Line Terminal) for transmitting digital broadcasting information received over an external broadcasting network and received external data communication information, an ONU (Optical Network Unit) for separating optical signals received from the OLT into broadcasting signals and  
15 communication signals, converting the broadcasting and communication signals to electrical signals, processing upstream information received from subscribers, and optically transmitting the broadcasting and communication signals selectively according to the individual subscribers, and an ONT (Optical Network Terminal) for converting an optical signal received from the ONU to an electrical signal, splitting the  
20 electrical signal for respective services, and transmitting the split electrical signals to a subscriber terminal, wherein the method comprises the steps of:

(a) providing a subscriber interface transmitter that:

(i)modulates a first predetermined number of broadcasting signals selected by the subscriber among broadcasting signals received from the OLT,

(ii) combines a baseband communication signal received from the OLT with the modulated broadcasting signals, and

(iii) optically transmits the combined communication-broadcasting signal; and

(b) providing a subscriber interface receiver that :

5 (i) splits the combined communication-broadcasting signal received from the subscriber interface transmitter,

(ii) filters the split signals to respective frequency bands,

(iii) modulates the filtered broadcasting signals,

(iv) transmits the modulated broadcasting signals to a monitor of the subscriber,

10 and

(v) transmits the filtered communication signal as a baseband signal to a communication terminal of the subscriber.

16. The method according to claim 15, wherein said subscriber interface  
15 transmitter includes:

the first predetermined number of modulators for modulating the broadcasting signals respectively in step (a) (i);

a second predetermined number of frequency generators for generating carrier frequencies to be assigned to the broadcasting signals);

20 a third predetermined number of BPFs (Band Pass Filters) for limiting the bands of the modulated broadcasting signals to suppress noise);

an LPF (Low Pass Filter) for limiting the band of the communication signal in step;

a combiner for combining the baseband communication signal with the

modulated broadcasting signals;

an optical transmitter/converter for converting the electrical combined communication-broadcasting signal to an optical signal prior to transmission to the ONT; and

- 5 an optical receiver/converter for receiving an Ethernet signal being upstream information received from the ONT and converting the optical Ethernet signal to an electrical signal.

17. The method according to claim 16, wherein the subscriber interface  
10 receiver provided in step (b) includes:

an optical receiver/converter for converting an optical signal received from the ONU;

a splitter for splitting the received optical into the first predetermined number of broadcasting signals and the communication signal;

- 15 a fourth predetermined number of BPFs for limiting the bands of the split broadcasting signals to extract the individual broadcasting signals;

a fifth predetermined number of demodulators for demodulating the broadcasting signals;

a sixth predetermined number of frequency generators each having a PLL  
20 (Phase Locked Loop) for generating a demodulation frequency for each of the broadcasting signals;

a seventh predetermined number of broadcasting signal outputs for outputting the first predetermined number of demodulated broadcasting signals;

an LPF for filtering the split communication signal in the baseband to extract

the communication signal; and

an optical transmitter for transmitting an upstream Ethernet signal to the ONU.

18. The method according to claim 17, further comprising the step of:

5        outputting the broadcasting signal to an LPF for extracting the demodulated  
broadcasting signals and a CDR (Clock & Data Recovery circuit) for recovering  
original broadcasting signals.